

CLAIMS

Claim 1-17: (cancelled)

Claim 18 (Currently Amended): A method for producing models in layers, comprising:

- (a) applying a first material in a layer on a building platform wherein the first material comprises a particulate material and a first reactive component;
- (b) selectively applying a second material to the first layer via a droplet production technique, wherein the second material comprises a second reactive component and a non-reacting carrying agent and calculating a quantity x_i of the non-reactive carrier agent to be used in the second material based upon the formula

$$x_i = \frac{m_h}{\left(\frac{r_p}{0,0254}\right)^2 \cdot v_{f,d} \cdot A_b \cdot \rho_h} \text{ , wherein } m_h \text{ is quantity of the first reactive component as}$$

determined by the product of the weight of the particulate material of the first material and a desired proportional mass of the first reactive component. r_p is a value of resolution in dots per inch of the droplet production technique. $v_{f,d}$ is a volume of liquid particles in the second material. A_b is an area of the layer to receive the second material, and ρ_h is the density of the second reactive component;

- (c) curing the first and second materials to form a solid; and
- (d) repeating steps (a) and (b) to achieve a plurality of layers to form a model, wherein the first material is a mixture of at least two components that is at least partially prepared prior to each applying step.

Claim 19 (Previously Presented): The method of claim 18, wherein the first material is prepared continually.

Claim 20 (Previously Presented): The method of claim 18, wherein the first material is prepared in batches.

Claims 21 - 22(Cancelled):

Claim 23 (Currently Amended): The method of claim 18, wherein the second reactive component is an binder.

Claim 24 (Previously Presented): The method of claim 18, wherein steps (a) and (b) are repeated before the curing step is complete.

Claim 25 (Previously Presented): The method of claim 18, wherein the first material remains porous during preparation.

Claim 26 (Previously Presented): The method of claim 18, wherein the selectively applying step comprises applying the second material using a droplet producing technique.

Claim 27 (Cancelled):

Claim 28 (Previously Presented): The method of claim 18, wherein the second material comprises a carrying agent.

Claim 29 (Previously Presented): The method of claim 18, wherein the curing step comprises forming a chemical bond between the first and second materials.

Claim 30 (Previously Presented): The method of claim 18, wherein the curing step comprises forming a physical bond between the first and second materials.

Claim 31 (Previously Presented): The method of claim 18, wherein the particulate material comprises a moulding sand chosen from the group including quartz sands, zircon sands, olivine sands, chamotte sands, and combinations thereof.

Claim 32 (Previously Presented): The method of claim 18, wherein the particulate material comprises a polystyrene powder, a polyamide powder, and combinations thereof.

Claim 33 (Previously Presented): The method of claim 18, wherein the first reactive component comprises furan resin, polyurethane resin, and combinations thereof.

Claim 34 (Previously Presented): The method of claim 18, wherein the model comprises a mould for a non-ferrous casting.

Claim 35 (Previously Presented): The method of claim 18, wherein the model comprises an investment pattern for a non-ferrous casting.

Claim 36 (Cancelled):

Claim 37 (Previously Presented): A method for producing models in layers, comprising:

- (a) applying a first material mixture in a layer on a building platform wherein the first material mixture comprises a quartz sand and a epoxy resin, wherein the epoxy resin is present between about 0.6 and 1.8% of the total weight of in the first material mixture;
- (b) selectively applying a second material mixture to the first layer via a droplet production technique, wherein the second material comprises a second reactive component and a non-reacting carrying agent, wherein a quantity x_2 of non-reactive carrier agent to be used in the second material is calculating based upon the formula

$$x_i = \frac{m_h}{\left(\frac{r_p}{0,0254}\right)^2 \cdot v_{f,d} \cdot A_b \cdot \rho_h}, \text{ wherein } m_h \text{ is quantity of the epoxy resin as determined by}$$

the product of the weight of the quartz sand of the first material and a desired proportional mass of the epoxy resin, r_p is a value of resolution in dots per inch of the droplet production technique, $v_{f,d}$ is a volume of liquid particles in the second material, A_b is an area of the layer to receive the second material, and ρ_h is the density of the second reactive component;

(d) curing the first and second materials to form a solid; and

(e) repeating steps (a) through (c) to achieve a plurality of layers to form a model, wherein the first material mixture is at least partially prepared prior to each applying step.